

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A sorbent particle, comprising:
a substrate having an ion exchange capacity of at least about 50 mEq/100g and a plurality of ion exchange sites; and
a plurality of disordered polyvalent metal oxides located at the plurality of ion exchange sites, wherein the polyvalent metal oxide comprises at least about 5 wt.% water of hydration, and wherein the substrate is vermiculite.
2. (Previously Presented) The sorbent particle of Claim 1, wherein the plurality of metal oxides is a plurality of metal hydroxides.
3. (Previously Presented) The sorbent particle of Claim 1, wherein the substrate is a silicate.
4. (Previously Presented) The sorbent particle of Claim 3, wherein the substrate is a phyllosilicate.
- 5-6. (Canceled)
7. (Previously Presented) The sorbent particle of Claim 3, wherein the ion exchange capacity ranges from about 50 to about 150 mEq/100g and wherein the metal oxide is a metal hydroxide.

8. (Previously Presented) The sorbent particle of Claim 1, wherein the polyvalent metal oxide is poorly crystallized and wherein a plurality of sorbent particles are adhered to a common carrier substrate.

9. (Currently Amended) The sorbent particle of Claim 1, wherein the polyvalent metal oxides ~~comprises~~ comprise a plurality of different types of polyvalent metals selected from the group consisting of zirconium, aluminum, lanthanum, titanium, manganese, tin, iron, zinc, tungsten, and mixtures thereof.

10. (Previously Presented) The sorbent particle of Claim 1, wherein the metal oxide comprises FeO(OH).

11. (Previously Presented) The sorbent particle of Claim 1, wherein the polyvalent metal is selected from the group consisting of zirconium, aluminum, lanthanum, titanium, manganese, tin, iron, zinc, tungsten, and mixtures thereof.

12. (Previously Presented) The sorbent particle of Claim 1, wherein the polyvalent metal is a transition metal.

13. (Previously Presented) The sorbent particle of Claim 1, further comprising a plurality of ionic contaminants sorbed onto the sorbent particle.

14-26. (Canceled)

27. (Previously Presented) A method for manufacturing a sorbent, comprising:

(a) contacting a solution comprising dissolved polyvalent metal ions with a substrate having a plurality of ion exchange sites to form an ion exchanged substrate having polyvalent

metal ions exchanged at the plurality of ion exchange sites, wherein the solution has an acidic pH; and

(b) contacting the ion exchanged substrate with an oxygen-containing fluid to convert at least most of the polyvalent metal ions exchanged at the plurality of ion exchange sites into metal oxides, wherein the substrate is vermiculite.

28. (Previously Presented) The method of Claim 27, wherein the polyvalent metal ions in step (a) are in the form of a salt in the solution, wherein step (b) follows step (a), and wherein, in step (b), the ion exchanged substrate is contacted with a source of hydroxyl ions to convert the ion-exchanged polyvalent metal ions into hydroxyl ions.

29. (Canceled)

30. (Previously Presented) The method of Claim 27, wherein the polyvalent metal is selected from the group consisting of zirconium, aluminum, lanthanum, titanium, manganese, tin, iron, zinc, tungsten, and mixtures thereof, wherein the solution in step (a) has a pH of less than about pH 2, wherein the fluid in step (b) is a liquid, and wherein the liquid has a basic pH.

31. (Previously Presented) The method of Claim 27, wherein the polyvalent metal is a transition metal, wherein the polyvalent metal is electropositive, wherein the solution in step (a) has a pH of less than about pH 2, wherein the fluid in step (b) is a liquid, and wherein the liquid has a pH ranging from about pH 7 to about pH 8.

32. (Previously Presented) The method of Claim 27, wherein the polyvalent metal oxide is poorly crystallized and wherein the metal oxide is in the form of a hydroxide.

33. (Previously Presented) The method of Claim 27, wherein the polyvalent metal oxide comprises at least about 5% water of hydration.

34. (Previously Presented) The method of Claim 27, wherein the substrate has an ion exchange capacity ranging from about 50 to about 150 mEq/100g and wherein the polyvalent metal ions comprise a plurality of different types of transition metals.

35. (Previously Presented) The method of Claim 27, wherein the polyvalent metal oxide is discontinuously distributed over the substrate and wherein a plurality of sorbent particles are located at differing locations on a carrier substrate.

36. (Previously Presented) The method of Claim 27, wherein a concentration of the dissolved polyvalent metal in the solution is at least about 1 Molar.

37. (Previously Presented) The method of Claim 27, wherein the polyvalent metal has a first valence state after the contacting step (b) and further comprising:

thereafter oxidizing the polyvalent metal to a second valence state, the first valence state being less than the second valence state and wherein the metal oxide comprises $\text{FeO}(\text{OH})$.

38. (Previously Presented) The method of Claim 37, wherein the polyvalent metal is manganese.

39-50. (Canceled)

51. (Previously Presented) The sorbent particle of Claim 13, wherein the at least one ionic contaminant is at least one of arsenic, selenium, copper, lead, cadmium, uranium, zinc, plutonium, phosphorus, molybdenum, mercury, and hydroxides and oxides thereof.

52. (Previously Presented) The sorbent particle of Claim 1, wherein the polyvalent metal oxide is poorly crystallized and wherein the sorbent particle is free of calcining.

53. (Previously Presented) The sorbent particle of Claim 1, wherein the substrate has an ion exchange capacity ranging from about 50 to about 150 mEq/g and wherein the metal oxide comprises a plurality of different types of transition metals.

54-64. (Canceled)